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MEXICAN SPECIES
OF ABUTILON SECT. *ARMATA* (MALVACEAE),
INCLUDING DESCRIPTIONS OF THREE NEW SPECIES

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Abutilon Mill. sect. *Armata* Presl is a natural group. Critical revision of the entire genus, including typification and evaluation of the approximately 25 infrageneric groups that have been named, may lead to the conclusion that this taxon should have another name and/or different rank; the group is thus accepted only provisionally as sect. *Armata*.

Characteristic features of this taxon include robust growth habit,

inflorescences of ample terminal panicles, reflexed petals, and distinctive floral bracts. Not all of the species have all of these characteristics, but the group nevertheless is distinct morphologically from the remainder of the genus. In addition to the Mexican species that are the subject of this paper, the group includes species from Central America [*A. cymosum* Triana & Planch.], the Caribbean [*A. elatum* (Macf.) Griseb.], and South America [e.g., *A. stenopetalum* Garcke, *A. thyrsoedendron* Griseb., *A. oxypetalum* Planch. & Lind., *A. reflexum* (Juss. ex Cav.) Sweet]. The Australasian *Abutilon auritum* (Wall. ex Link) Sweet is reported to reach Mexico and other parts of the neotropics as an adventive, but it seems probable that these reports are based at least in part on misidentified specimens of the very similar *A. elatum*, *A. andrieuxii* Hemsl., and *A. haenkeanum* Presl. The relation between these Old and New World species deserves detailed investigation.

Examination of some recent collections of *Abutilon* from Mexico led to recognition of three new species that belong to this section; these are described below.

In reviewing the section, it became apparent that Kearney (1955), in his key to North American species of *Abutilon* (the best available key to these plants), misunderstood the occurrence of reflexed petals (as did Baker, 1893) and the development of stipules, two important characters in this group. I have therefore prepared a key to the ten species of *Abutilon* sect. *Armata* that occur in Mexico and supplemented this with distributional and other data on these species. All of these species are confined to Mexico except *A. andrieuxii*, *A. divaricatum* Turcz., and *A. giganteum* (Jacq.) Sweet, which extend southward, the last-named occurring principally in northern South America, and *A. sonorae* A. Gray and *A. reventum* S. Wats., both of which may also be found to the north in southwestern United States (see fig. 1).

ABUTILON sect. ARMATA Presl, Rel. Haenk. 2:114. 1835. Lectotype (here designated): *Abutilon haenkeanum* Presl, Rel. Haenk. 2:115. 1835.

Plants robust, sometimes arborescent, often large shrubs or sub-shrubs, sometimes herbaceous perennials, but generally of vigorous growth, commonly 2 m or more high. Leaves long-petiolate, deeply cordate, subtire to dentate, often acuminate, simple and ovate or somewhat trilobed. Stipules variable: usually early caducous, sometimes large and conspicuous, toothed or lacinate and/or auriculate-clasping, sometimes narrowly subulate. Inflorescence an ample terminal panicle, usually of such proportions as to be difficult to represent adequately in a dried specimen. Characteristic floral bracts in pairs, subtending individual flowers as a pseudo-involucel, often enclosing the buds, the bracts early-caducous, often connate along their dorsal margin and sometimes apically dentate or lacinate; they are interpreted as modified stipules. Flowers usually small, the petals often reflexed, white, yellow, orange, or (in two species) violet or purple. Fruits ca 1 cm long (to 2 cm in *A. divaricatum*); meri-

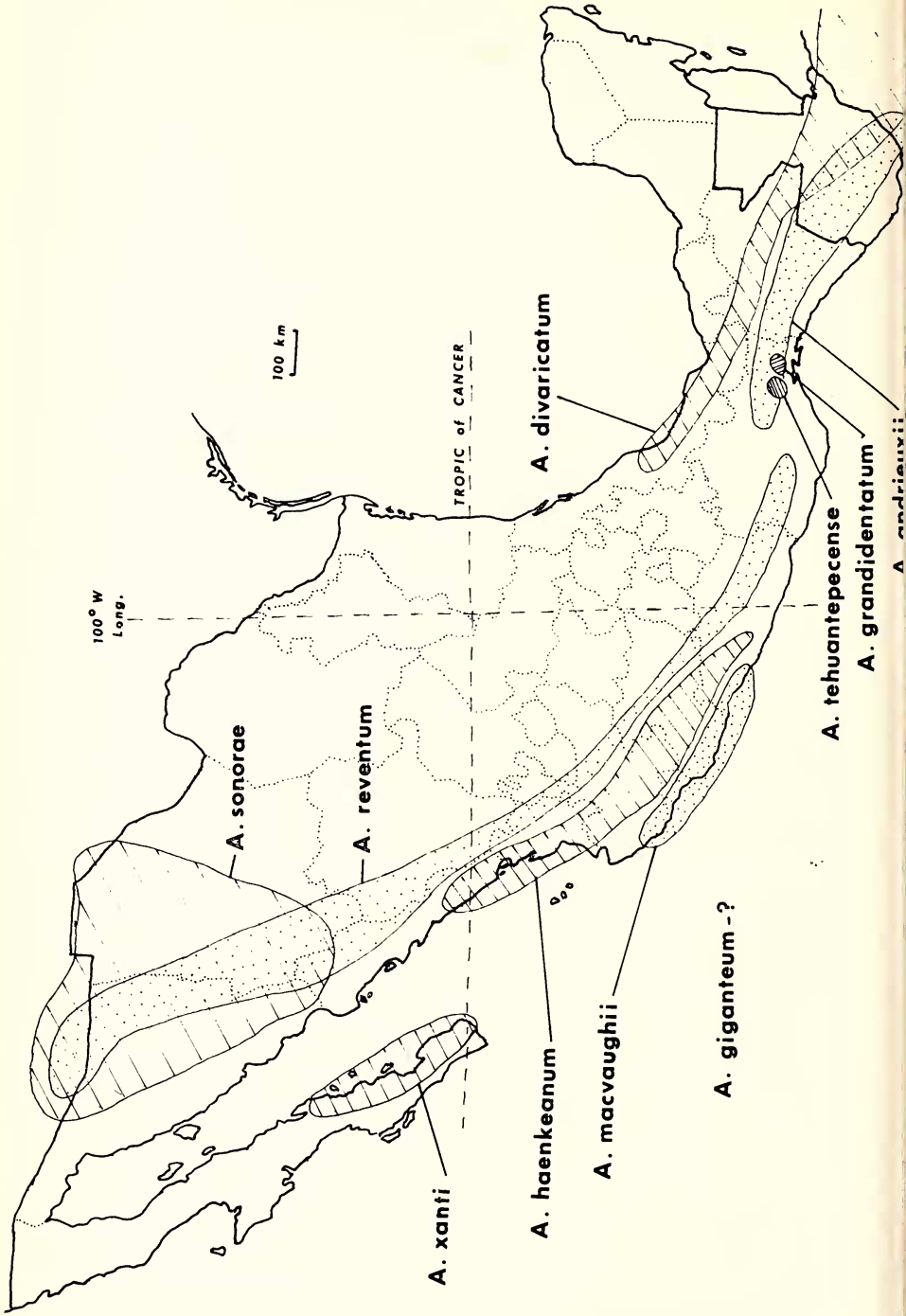


FIG. 1. Generalized distribution of *Agave* species in Mexico.

carps 6–10 (12–15 in *A. giganteum*), usually rounded or acute and short-spined apically, sometimes acuminate.

In proposing *Abutilon* sect. *Armata*, Presl included eight species. In order to clarify Presl's concept, I choose *A. haenkeanum* as lectotype. In addition, I exclude four of the eight species that he included: *A. triquetrum* (L.) Presl, *A. ramosissimum* Presl [both of which are synonymous with *A. trisulcatum* (Jacq.) Ulbr.], and two Peruvian species, *A. calycinum* Presl and *A. vitifolium* (Cav.) Presl. The last-named is the type species of the genus *Corynabutilon* (K. Schum.) Kearns.

Key to Mexican species of *Abutilon* sect. *Armata* Presl

- a. Petals violet or purple throughout, reflexed; calyx 10–15 mm long; stems viscid; staminal column pubescent (Oaxaca).
 - b. Petals purple, wholly glabrous; calyx 12–15 mm long; filaments 3–5 mm long; leaves coarsely dentate, often weakly trilobed; stems with long, simple hairs (1–2 mm long) in addition to glandular hairs. 1. *A. grandidentatum* (fig. 2)
 - bb. Petals violet, stellate-pubescent externally on proximal third; calyx 10–12 mm long; filaments 2.0–2.5 mm long; leaves denticulate, unlobed (?); stems lacking long, non-glandular hairs.
 - 2. *A. tehuantepecense*
- aa. Petals white, buff, yellow, or orange, sometimes with dark basal spot, reflexed or not; calyx 4–11 mm long; stems usually not viscid; staminal column glabrous or pubescent.
 - c. Pedicels stout (1.5–2.0 mm diam.); petals markedly reflexed, with basal spot; staminal column glabrous, 5–9 mm long; filaments 4–5 mm long; mericarps 12–15 (Mexico?, South America).
 - 3. *A. giganteum* (fig. 3, A–C)
 - cc. Pedicels slender (up to 1 mm diam.); petals reflexed or not; staminal column glabrous or pubescent, 2–6 mm long; filaments 1–4 mm long; mericarps 8–12.
 - d. Simple hairs of stem and petioles dense, 1–2 mm long, somewhat retrorse; mericarps 12–20 mm long, strongly keeled dorsally; calyx divided almost to the base, the lobes narrow and fully reflexed in fruit; petals yellowish or buff with basal spot, stellate-pubescent externally at base (Mexico to Panama).
 - 4. *A. divaricatum* (fig. 3, D–G)
- dd. Simple hairs on stem and petioles sparse or lacking (or present in *A. sonorae* and > 2 mm long and patent); mericarps 8–12 mm long; calyx $\frac{1}{2}$ – $\frac{2}{3}$ -divided, the lobes not reflexed in fruit; petals usually without basal spot.
 - e. Petals yellow or white, glabrous; staminal column glabrous; stipules narrow and inconspicuous.
 - f. Petals yellow, 9–13 mm long; mericarps obtuse; stems often dark-pigmented, sparsely and minutely viscid-pubescent and stellate-pubescent to glabrate (Oaxaca to Arizona).
 - 5. *A. reventum* (fig. 4, A–B)

- ff. Petals yellow to white, 5–9 mm long; mericarps apiculate or acuminate; stems often densely pubescent but not viscid.
- g. Stems and petioles with long, simple hairs 2–3(–4) mm long (these sometimes lacking in inflorescence); calyx 4–5 mm long; petals 5–6 mm long, yellowish (Guerrero to Arizona). 6. *A. sonorae* (fig. 4, C–F)
- gg. Stems and petioles velvety-tomentose, lacking long, simple hairs; calyx 6–12 mm long; petals 7–9 mm long, whitish, sometimes somewhat reflexed (Baja California).
7. *A. xanti* (fig. 4, G–H)
- ee. Petals yellow or orange, often with minute external pubescence; staminal column stellate-pubescent at least at base; stipules broad and prominent, auriculate-clasping (but caducous).
- h. Petals yellow, 18–20 mm long, not reflexed, externally stellate-pubescent at base; calyx 8–10 mm long; filaments 3–4 mm long; mericarps apically acute (coastal Jalisco and Guerrero). 8. *A. macvaughii* (fig. 5, F–G)
- hh. Petals orange, 8–12 mm long, reflexed, often with scattered multicellular hairs externally at least on margin; calyx 4–10 mm long; filaments 1.0–1.5 mm long; mericarps apically obtuse or acute.
- i. Calyx 4–7 mm long (< half length of mericarps); mericarps short-puberulent, relatively blunt or acute apically (Oaxaca and Chiapas, Guatemala, and El Salvador).
9. *A. andrieuxii* (fig. 5, A–D)
- ii. Calyx 6–10 mm long (> half length of mericarps); mericarps long-hirsute, acuminate (Guerrero to Sinaloa).
10. *A. haenkeanum* (fig. 5, E).

1. ***Abutilon grandidentatum*** Fryx., sp. nov. sectionis *Armatae* (fig. 2). Arbor parva vel frutex grandis, ramunculis pilis brevibus (< 0.5 mm) glanduliferis obtectis, interdum pilis longis (> 1 mm) eglanduliferis immixtis, demum glabrescentibus. Folia profunde cordata, late ovata, interdum leviter 3-lobata, acuminata, grosse dentata (dentibus 2–6 mm longis, 4–6 mm latis), palmatim 9-nervata, nervis pallidis, usque ad 10 cm longa, 9 cm lata, utrinque dense et molliter pubescentes, pubescentiis stellatis et albidis, plus minusve discoloria saltem juventute. Petioli usque ad 6 cm longi (quam lamina brevior), pubescentiis caulis similis. Stipulae 7–15 mm longae, angustae (2 mm latae) et lanceolatae vel latiores (5–6 mm latae) et ovatae, interdum paribus stipularum connatis in marginibus dorsalibus organum singulum formantia, membranacea, pubescentes, manifestae sed maturae caducae; paria stipularum infra quoque alabastrum in inflorescentia pseudo-involucellum formantia. Flores 2–3 cm diam., interdum in axillis solitarii sed plerumque in paniculis terminalibus congestis. Pedicelli 2–10 mm longi, glanduloso-

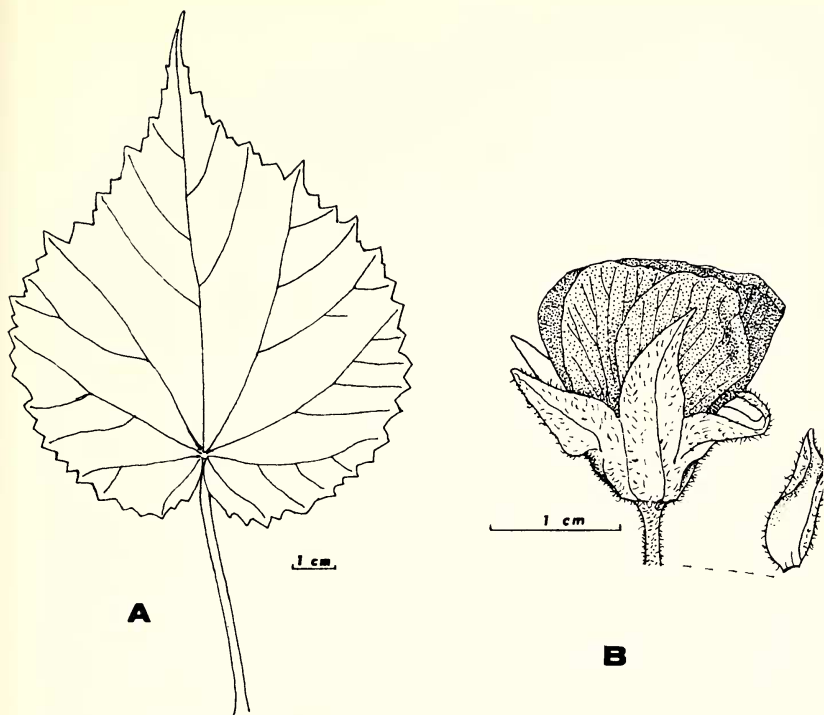


FIG. 2. *Abutilon grandidentatum* (MacDougall H143). A, leaf; B, flower and floral bract.

pubescentes, interdum pilis longis eglandulosis adjectis. Calyces 12–15 mm longi, utrinque dense pubescentes, pilis stellatis et pilis (longis) simplicibus instructis, saepe ad basim brunneoli, plus quam semi-divisi, lobis 1-nervatis, ad basim 4–5 mm latis, 8–10 mm longis. Petala purpurea, reflexa ut videtur, 10–15 mm longa, 8–15 mm lata, glabra; unguis 3–4 mm lata. Columna staminalis 5 mm longa, infra semi-globosa (3–4 mm diam.), supra in columna 1 mm diam. angustata, pallida, stellato-pubescentes praesertim infra; filamenta numerosa, ex apice columnae plus minusve erecta, 3–4 mm longa, pallida, glabra; antherae armeniacaee; pollen armeniacum, globulosum, spinosum. Styli stamina excedentes demum, ca 8, glabri, purpurascens; stigmata capitata, atropurpurea. Fructus 8–10 mm longi, stellato-pubescentes praesertim secus suturas, pilis multicellularis glandularis in pariete dorsali; mericarpia ad apicem acuta, dehiscentia, 1–3-seminalis.

TYPE: Mexico, Oaxaca, Cerro Guiengola near Tehuantepec, elev. 500 ft, compact shrub to ca 5 ft, flowers rose-purple, in sun, 11 Dec 1971, T. MacDougall H143. Holotype: NY; isotypes: F, pf. PARATYPES: Mexico, Oaxaca, Jalapa [near Tehuantepec], Cerro Calderona, elev. 100–2000 ft, small tree with purple-red flowers, in sun, 18 Feb 1972,

T. MacDougall H270 (NY, pf); Ocotita, near Tehuantepec, elev. 500 ft, tree with purple flowers, in sun, 8 May 1972, *T. MacDougall* H442 (NY, pf).

DISTRIBUTION: Known only from the specimens cited above, from the vicinity of Tehuantepec, Oaxaca, at low elevation.

This species is distinctive in its coarsely dentate leaves (fig. 2, A), its purple corolla, and its relatively large calyx (fig. 2, B). It is surprising that this species has not been recognized before, since it is a robust shrub or small tree with relatively showy flowers. The restricted distribution of the species is probably the reason this is so.

2. ***Abutilon tehuantepecense*** Fryx., sp. nov. sectionis *Armatae*. Arbor staturae ignotae sed probabiliter parva. Ramunculi juventute minute et dense glanduloso-puberuli, demum glabrati et aliquantum striati vel angulati. Folia valde discoloria, cordata, ovata, acuta vel acuminata, palmatim 7–9-nervata, leniter denticulata, infra minute pannosa; (folia bene evoluta destituta). Petioli minute stellato-puberuli, quam lamina dimidio longiori. Stipulae 5–9 mm longae, 2–4 mm latae, lanceolatae vel interdum (in inflorescentia) paribus stipularum connatis secus margines dorsales alabastrum includentibus, glanduloso-pubescentes, maturae caducae. Inflorescentia paniculata ut videtur. Flores 15–20 mm diam. Pedicelli 5–12 mm longi, glanduloso-puberuli. Calyces 10–12 mm longi, in alabastro plicati, dense albo-tomentosi, plus quam semi-divisi, lobis ad basim 3–4 mm latis, 7–9 mm longis, triangularis, 1-nervatis, demum ad basim gibbosescens. Petala lavandulacea (vel color in sicco destructus), reflexa, 10–11 mm longa, 5–7 mm lata, unguibus 2–3 mm latis, intus glabra praeter dense coacta in marginibus unquium, extus dense stellato-pubescentia in tertia parte proximali et glabra in parte distali. Columna staminalis dense stellato-pubescentia ubique, ad basim 2.5–3.0 mm diam. gradatim decrescens sursum ad 1.0 mm diam., superne purpurascens; filamenta ex tertia parte distali columnae exorientia, vix purpurascens vel atropurpurea, glabra, 2.0–2.5 mm longa, plerumque reflexa; antherae luteolae, < 1 mm longae; pollen luteum, globulosum, spinosum. Styli ca 6, pallidi, androecium vix aequantes; stigmata capitata, viridipurpurea vel atropurpurea. Fructus 1 cm longi, calycem subaequantes, stellato-pubescentes; mericarpia ca 6, ad apicem acuminata, calcari 1 mm longo, dehiscentia, pluri-seminalis ut videtur.

TYPE: Mexico, Oaxaca, Tehuantepec, Cerro de las Animas, tree with pale violet flowers, in sun, 27 Dec 1971, *T. MacDougall* H166. Holotype: NY; isotypes: F, pf. **PARATYPE:** Mexico, Oaxaca, San Bartolo Yautepec, Puerto San Bartolo, elev. 2500 ft, tree with purple flowers, orange stamens, in sun, 2 Feb 1972, *T. MacDougall* H229 (NY, F, pf.)

DISTRIBUTION: Known only from the specimens cited above, from near and to the west of Tehuantepec, Oaxaca, evidently at somewhat higher elevation than the preceding species.

This species is distinctive in its arborescent habit and violet flowers.

Like the preceding species it has probably escaped discovery until now because of a restricted distribution.

3. *ABUTILON GIGANTEUM* (Jacq.) Sweet, Hort. Brit. ed. I. 1:53. 1826.—*Sida gigantea* Jacq. TYPE: Hort. Schoenbr. t. 141! (from Venezuela).

Abutilon mexicanum Presl, Rel. Haenk. 2:115. 1835. TYPE: In terris mexicanus occidentalibus, *Haenke s.n.* Holotype: PR!

Abutilon pseudogiganteum Steyerl., Fieldiana, Bot. 28:362. 1952. TYPE: Venezuela; Anzoátegui; between San José and Cucutá, *Steyermark 61519*. Holotype: F!

DISTRIBUTION: Northern South America; although freely reported from Central America to southern Mexico (largely on the basis of misidentified specimens of *A. divaricatum*), it is known to me from Mexico only by Haenke's specimen, the type of *A. mexicanum*.

This species is distinctive for its reflexed petals with a basal spot on each, its long staminal column (fig. 3, A), its relatively stout pedicels (1.5–2.0 mm diam.), and its more numerous (12–15) mericarps (fig. 3, B). It has been confused with *A. divaricatum* and with *A. elatum* [e.g., by Standley (1923, 1937) and Standley and Steyerl. (1949)] but is clearly distinct from both. The preceding key (and fig. 3) distinguish *A. giganteum* and *A. divaricatum*; the Caribbean *A. elatum* differs from them in petal color and in having smaller mericarps, smaller stipules, and velvety indumentum. *Abutilon elatum* is closely allied to *A. andrieuxii* and *A. haenkeanum*.

REPRESENTATIVE SPECIMENS: Mexico, *Haenke s.n.* (PR). Venezuela, *Fernandez 436* (F), *Montaldo 3622* (F), *Krapovickas 15568* (CTES, MO, pf). Colombia, *Smith 732* (F, MICH, MO, TEX), *Killip et al. 38224* (F), *Haught 2410* (F), *Cuatrecasas and Perez Arbeláez 6569* (F). Peru, *Ferryra 7739* (F), *Klug 3887, 4370* (F, MO).

4. *ABUTILON DIVARICATUM* Turcz., Bull. Soc. Imp. Naturalistes Moscou 31:204. 1858. LECTOTYPE (here designated): Veracruz, Mirador, *Galeotti 4071*. Holotype: presumably at KW, not seen; isolectotype: BR!, G, as photo F!

Abutilon chiriquinum A. Robyns, Ann. Missouri Bot. Gard. 52:574. 1966. TYPE: Panama, Prov. Chiriqui, vicinity of El Boquete, *Bro. Maurice 705*. Holotype: US!

DISTRIBUTION: Veracruz and Chiapas, through Central America as far south as Panama, mostly from elevations of 1200–2300 m but occasionally at lower elevations.

This species is distinctive in its narrow calyx lobes that are fully reflexed in fruit (fig. 3, D–E), in its large, prominently keeled mericarps (fig. 3, E), and in its dense, somewhat retrorse stem pubescence (fig. 3, F).

This species has been poorly understood for several reasons. Turczaninow cited two collections from Veracruz (*Galeotti 4071* and *Linden*

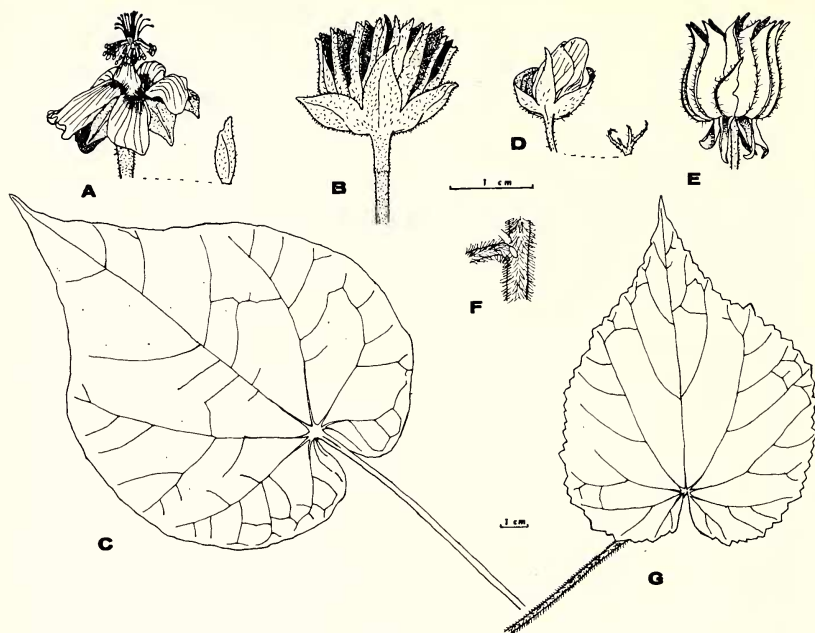


FIG. 3. A-C, *Abutilon giganteum*. A, flower and floral bract (Haught 2410); B, fruit (Cuatrecasas and Perez Abeláez 6569); C, leaf (Killip et al. 38224). D-G, *Abutilon divaricatum*. D, bud and floral bract (Rosas 1468); E, fruit (Steyermark 34393); F, stem and petiole, illustrating nature of vestiture (Rosas 1468); G, leaf (Molina et al. 15969).

1378) and one from Ecuador (Jameson 605). These three collections represent two species. A duplicate (presumably at B or BR) of the Jameson specimen was later cited as a syntype of *Abutilon cordatum* Garcke & Schum. (non Rafin.), the name by which the plant from Peru and Ecuador is now known (e.g., Baker, 1893; Macbride, 1956).

Baker (1893) recognized the distinctiveness of *A. divaricatum* (having examined duplicates of the Jameson and Linden specimens) and cited Jameson 605 for *A. cordatum* and Linden 1378, Galeotti 4071, and Borgeau 1740 (all presumably at BM) for *A. divaricatum*; he failed to note that the Jameson collection was cited in the protologues of both names. This was noted by Garcke (1893), who had also examined the Jameson collection (but not the others) and who observed that its dispersive condition was in contradiction to Turczaninow's description of *A. divaricatum*. However, Garcke (who was followed by Kearney, 1958) failed to conclude that two species were involved, as Baker had done, even though Schumann (1891, p. 398), with whom Garcke co-authored *A. cordatum*, clearly implied that Turczaninow's name referred to a mixture of two species. Garcke therefore accepted the older name *A. divaricatum* (and considered *A. cordatum* superfluous) and applied it to

the South American plant, since he had studied only the Jameson specimen and none of the Veracruz material. Kearney (1958) accepted this view and, in his treatment of North American species of *Abutilon* (1955), omitted reference to *A. divaricatum*, evidently confusing this plant with *A. giganteum*, probably because Standley (1923, 1937) and Standley and Steyermark (1949) had earlier confused these two species, citing specimens of the former under the latter name.

It seems best to restrict Turczaninow's name to the Veracruz material, as is done in the above lectotypification, and specifically to exclude the Jameson collection, since it can be shown to differ from Turczaninow's description in several particulars.

REPRESENTATIVE SPECIMENS: Veracruz, *Purpus* 8313 (F, US), 16649, 16702 (US), *Rosas* 1468 (A, MEXU). Chiapas, *Breedlove* 8984 (F). Guatemala, *Standley* 84567, 77239, 83171, 63031, 62909, 60341, 86575, 32525 (F), 63306, 64345 (F, MICH), Steyermark 34393 (F), *Williams et al.* 25288 (F), *Molina et al.* 15969 (F), *Aguilar* 768, 216 (F), *von Turckheim* 341 (MICH). Honduras, *Molina* 7633, 7383 (F), *Standley and Molina* 4521 (F). Costa Rica, *Brenes* 12745 (F), *Standley and Valerio* 43488 (F), *Tonduz* 6792 (MO), *Standley* 32852 (F).

5. *ABUTILON REVENTUM* S. Wats., Proc. Amer. Acad. Arts 21:418. 1886.

TYPE: Chihuahua, Hacienda San José, 25 mi S of Batopilas, Aug 1885, *Palmer* 56. Holotype: GH!; isotype: US!.

DISTRIBUTION: Known from southern Arizona, Sonora, and Chihuahua and in western Mexico as far south as Oaxaca, from elevations of 850–1800 m.

This species is distinctive in its sparsely viscid to glabrate and often darkly pigmented stems and its rounded fruits with more or less obtuse mericarps (fig. 4, B).

REPRESENTATIVE SPECIMENS: Arizona, *Gould* 3303 (TAES), *Pinkava and Lehto* 6255 (ASU). Sonora, *White* 2770, 4163, 3518 (MICH), *Phillips* 467 (MICH). Chihuahua, *Palmer* 56 (MICH). Durango, *Palmer* 499 (F, MO, UC). Sinaloa, 31 Oct 1904, *Brandegge s.n.* (UC). Jalisco, *Fryxell* 1035 (BH, CTES, DH, GH, pf), *Fryxell, Bates and Blanchard* 1591, 1600 (BH, pf), 1599 (BH, TEX, pf). Guerrero, *Fryxell and Bates* 2171 (BH, ENCB, pf). Oaxaca, *Fryxell* 1150 (TEX, pf).

6. *ABUTILON SONORAE* A. Gray, Smithsonian Contr. Knowl. 5(6):23.

1853. TYPE: Sonora, Sonoita River, *Wright* 899. Holotype: GH! isotype: NY!

DISTRIBUTION: Known from southern Arizona, western Texas, Sonora, and Chihuahua, and from an isolated collection in Guerrero, mostly at elevations of 350–1400 m.

This species is characterized by long, spreading hairs 2–3(–4) mm long on the stems and petioles (fig. 4, E), especially in the lower part of the plant (often lacking in the inflorescence), and by its frequently trilobed leaves (fig. 4, F).

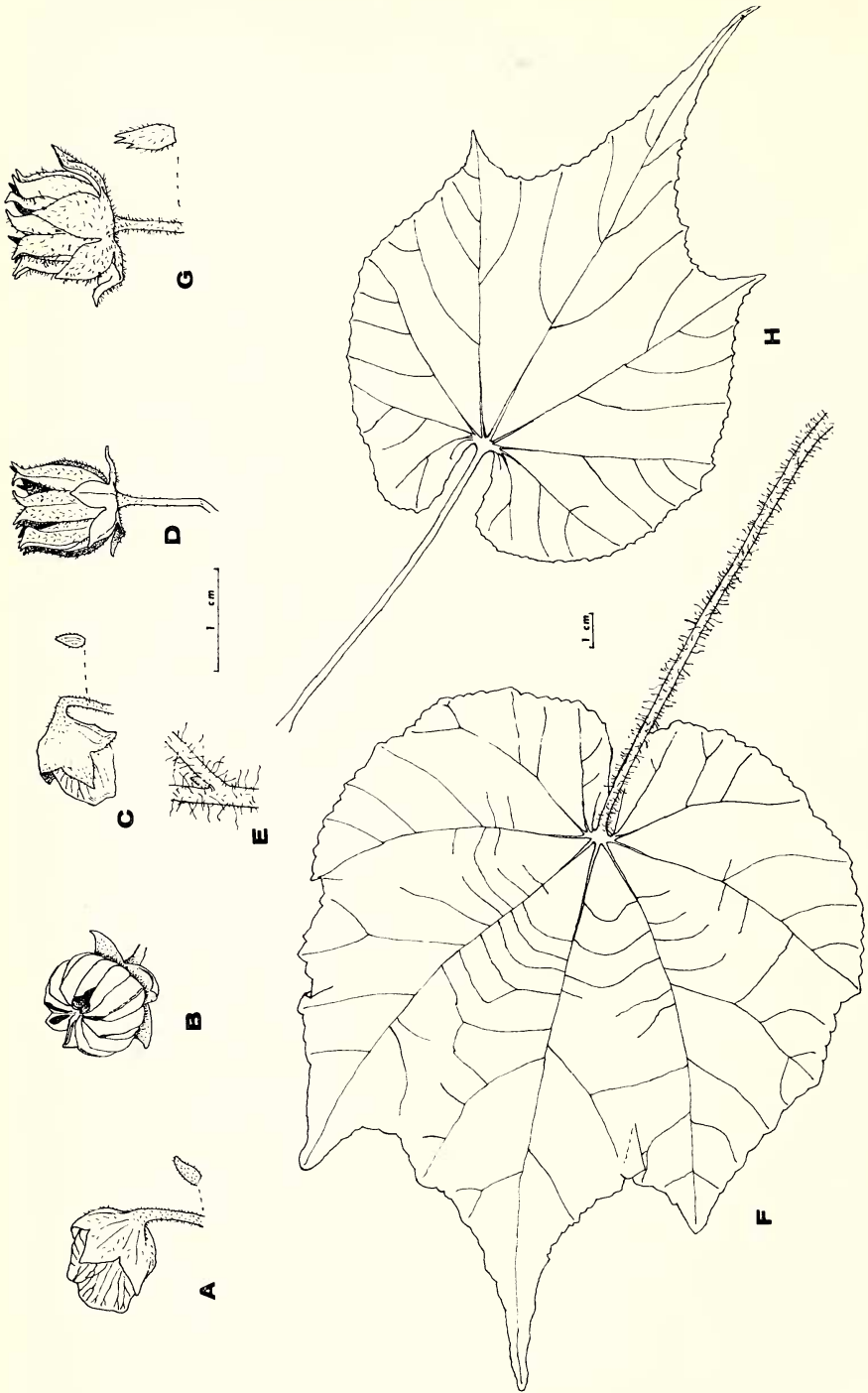


FIG. 4. A-B, *Abutilon venustum*. A, bud and floral bract (Fryxell 1150); B, fruit (Fryxell and Bates 2171); C-E, *Abutilon sonora*. C, bud and floral bract (Wiggins 7017); D, fruit (Shreve 6643); E, stem and petiole, illustrating nature of vestiture (Shreve 6643); F, leaf (Wiggins 7017); G-H *Abutilon rami* (Fryxell 1000). G, fruit and floral bract; H, leaf.

REPRESENTATIVE SPECIMENS: Texas, *Correll 15090* (LL). Arizona, *Thornber 7582* (TAES), *Peebles 8993* (F). Sonora, *Drovet and Richards 3507, 3749* (F), *White 4681* (MICH), *Wiggins 7017, 7478* (MICH), *Muller 3615* (MICH), UC), *Shreve 6643* (MICH), *Wiggins and Rollins 373* (MICH, MO). Chihuahua, *Pringle 329* (F, MO) 944 (MO, MSC, UC), *Gentry 2891* (DES, F, MO, UC), *Palmer 171* (MICH). Guerrero, *Palmer 45* (F, LL, MO, UC).

7. ABUTILON *xanti* A. Gray, Proc. Amer. Acad. Arts 22:301. 1887. TYPE: Baja California, Cape San Lucas, *L. J. Xantus 9*. Holotype: GH!; isotypes: NY! US!.

Abutilon carterae Kearney, Madroño 12:114. 1953. TYPE: Baja California (Distrito del Sur). Arroyo de Tabor, Sierra de la Giganta, W of Puerto Escondido, *Carter and Kellogg 2871*. Holotype: CAS!; isotypes: UC!, US!.

DISTRIBUTION: Baja California from the vicinity of Loreto south to the end of the peninsula, at elevations up to 650 m.

In describing *Abutilon xanti*, Gray noted its alliance to *A. sonorae* and *A. reventum*, and Baker (1893, p. 73) commented on the same similarity. Standley (1923) also reflected this alliance by the placement of *A. xanti* in his key to the Mexican species of *Abutilon* (loc. cit., p. 749). Kearney's description of *A. carterae* noted a resemblance of his species to *A. sonorae* but made no reference to Gray's species. In his key to North American species of *Abutilon*, Kearney (1955) recognized both *A. xanti* and *A. carterae* and distinguished them in his key at couplet 38, whether the calyx is more or less than $\frac{2}{3}$ the length of the mature fruit. Wiggins (1964) used the same distinction, modified to: calyx "much shorter than" vs. "nearly equaling or surpassing" the mature carpels. The original description of *A. carterae* states that the calyx is 0.6 times the length of the fruit and that of *A. xanti* says the calyx is nearly equal to the fruit. An examination of the holotype of *A. xanti* reveals that the calyx varies in length from half that of the fruit to nearly equaling the fruit. Kearney's criterion is thus found to be artificial in this instance (although otherwise useful in distinguishing species), and an examination of a range of material indicates that the plants that occur in Baja California may be encompassed in a single species, the earlier name for which is *A. xanti*.

This species is somewhat variable and is similar to *A. sonorae*, both having often trilobed leaves (fig. 4, H) and relatively pale flowers. The densely soft-tomentose stems and petioles of *A. xanti* contrast with the long-hirsute stems and petioles of *A. sonorae*. These species differ in other characters as well, the calyx and petals in *A. xanti* being longer (fig. 4, G), the staminal column shorter, and the floral bracts more commonly dentate than in *A. sonorae*.

REPRESENTATIVE SPECIMENS: Baja California, *Carter and Sharsmith 4258* (UC), *Carter and Sousa 5177* (UC, pf), *Carter and Ferris 4087, 4077* (UC, pf), *Carter, Alexander, and Kellogg 2055* (LL, UC, US),

Gentry 4111 (DES), *Moran 7331* (MICH, UC), *Fryxell 1982* (CTES, ENCB, pf), *1990* (BH, CTES, ENCB, pf).

8. ***Abutilon macvaughii*** Fryx., sp. nov. sectionis *Armatae* (fig. 5, F-G). Frutex usque ad 3 m altus. Caules minute stellato-pubescentes pilis dispersis, ca 0.1 mm diam. Folia profunde cordata, ovata, acuminata, subintegra, 9-11-pedatinervata, usque ad 14 cm longa, 10 cm lata, discoloria, supra viridia et glabrata, infra minute molli-pubescentia et albida. Petioli usque ad 10 cm longi, pubescentiis caulis similis. Stipulae auriculato-amplexicaules, late falcatae, 18-20 mm longae, 8-10 mm latae; stipulae inflorescentiae aliquantum breviores sed 3-4-laciniatae et velut pseudo-involucellum binatim alabastra includentes. Inflorescentia racemosa vel paniculata. Pedicelli 2-20 mm longi, minute puberuli. Calyces ca 10 mm longi, minute puberuli, plus minusve semi-divisi; lobi ad basim 5-6 mm lati, aliquantum longiori quam latiori, sine nervis prominentibus, demum ad basim gibbosescens. Petala flavida, 18-20 mm longa, 10-15 mm lata, unguibus 2.5-3.0 mm latis, intus glabra praeter dense pubescentia in marginibus unguium, extus stellato-pubescentia ad basim, ceterum glabra. Columna staminalis pallida, 6 mm longa, 4 mm diam. ad basim, sursum decrescens ad 1 mm diam., stellato-pubescentia praeter ad apicem. Filamenta pallida, 3-4 mm longa, erecta, ex apice columnae omnino exorientia; antherae < 1 mm longae, pallidae; pollen luteum, globosum, spinosum. Styli 10, androecium excedentes, glabri, viridipallidi; stigmata capitata, purpurata. Fructus dense et minute stellato-pubescentes; mericarpia 10, 8-9 mm longa (sed immatura), ad apicem acuta.

TYPE: Mexico, Jalisco, 8 km E of Chamela, elev. 30-50 m, shrub—2-3 m high, abundant, flowers bright yellow, 8-10 Dec 1970, *R. McVaugh 25118*. Holotype: MICH; isotypes: pf, and to be distributed by MICH. PARATYPES: Jalisco, Estación Biologica de Chamela de la UNAM, alt. 80 m, vegetación secundaria, arbusto de 1.5-2.5 m de alto, 7 Mar 1973, *Souza* (con *Perez y Sarukhán*) 3889 (MEXU); Chamela, alt. 90 m, flores amarillas, 9 Mar 1973, *Souza* (con *Perez y Sarukhán*) 3913 (MEXU). Guerrero, Tecpan, alt. 150 m, petit arbuste, fleurs jaunes, sol granitique, 12 Dec 1899, *E. Langlassé 742* (US).

DISTRIBUTION: Known only from the specimens cited above from coastal Jalisco and Guerrero, at low elevation. The specimen of Langlassé from Guerrero probably belongs in this species. The specimen is incomplete, however, so this conclusion is only tentative. It differs in certain characters from the Jalisco material; if these differences prove to be real and consistent on the basis of additional material from coastal Guerrero, they do not appear to merit recognition at more than subspecific rank.

This species is distinctive for its large yellow flowers and its well developed floral bracts (fig. 5, F). The flowers are reported (M. Sousa, in litt.) to be visited by female carpenter bees (*Xylocopa mexicanorum* Cockerell).

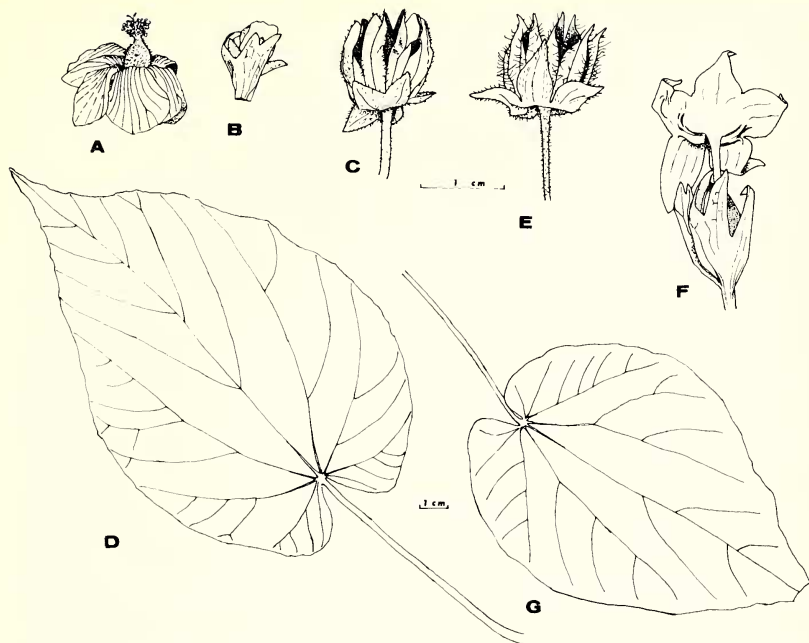


FIG. 5. A-D, *Abutilon andrieuxii* (Ton 3772); A, flower; B, bud enclosed within floral bract; C, fruit; D, leaf; E, *Abutilon haenkeanum*, fruit (Fryxell 1716). F-G, *Abutilon macvaughii* (McVaugh 25118). F, calyx and floral bracts; G, leaf.

9. **ABUTILON ANDRIEUXII** Hemsl., *Diagn. Pl. Nov.* 24. 1879. **TYPE:** Oaxaca: Tlacolula, *Andrieux 522*. Holotype: G, photo F!

Abutilon reticulatum Rose, *Contr. U. S. Natl. Herb.* 5:171. 1899. **SYNTYPES:** Oaxaca, Monte Alban, *Pringle 6062* (F! MICH! MO! MSC! UC! US!); in cult., *Rose 1122* (MO! NY! US!).

Abutilon calderonii Standl., *J. Wash. Acad. Sci.* 14:99. 1924. **TYPE:** El Salvador, San Salvador, *Calderón 1639*. Holotype: US!

DISTRIBUTION: Oaxaca and Chiapas, southward to Guatemala and El Salvador, at elevations of 300–1800 m.

This species and *A. haenkeanum* are distinguished by their orange, reflexed petals with minute external pubescence and by their very short filaments, 1.0–1.5 mm long (fig. 5, A). The characters distinguishing *A. andrieuxii* and *A. haenkeanum* are given in the key (cf. figs. 5, C and 5, E).

REPRESENTATIVE SPECIMENS: "Nova Hispania", *Sessé, Mociño, Castillo and Maldonado 3475* (F). Oaxaca, *Fryxell and Bates 904* (BH, pf). Chiapas, *Ton 3772* (F, pf), *3909* (CAS, pf), *Fryxell and Bates 894* (ARIZ, BH, CTES, L, MEXU, pf), *901* (BH, CAS, CTES, pf). Guatemala, *Williams, Molina and Williams 22443* (F), *Standley 61353* (F), *Kellerman 7804* (F), anonymous *1713* (F). El Salvador, *Williams and Molina 15238* (F), *Tucker 930* (LL).

10. *ABUTILON HAENKEANUM* Presl, Rel. Haenk. 2:115. 1835. TYPE: In terris mexicanus occidentalibus, *Haenke s.n.* Holotype: PR!; iso-types: MO!, W, as photo F!.

Sida presliana D. Dietr., Syn. Pl. 4:856. 1847 [based on *A. haenkeanum*].

DISTRIBUTION: In western Mexico from Sinaloa to Guerrero, at elevations up to 450 m.

This species and *A. andrieuxii* are distinctive for their orange, reflexed petals with minute external pubescence and for their very short filaments, 1.0–1.5 mm long. The characters distinguishing *A. haenkeanum* and *A. andrieuxii* are given in the key (cf. figs. 5, C and 5, E).

REPRESENTATIVE SPECIMENS: Sinaloa, *Gentry 5644* (DES, MICH, NA). Colima, *Fryxell 1049* (BH, MEXU, MICH, US, pf), *1054* (CTES, MICH, NY, pf). Michoacán, *McVaugh 22604* (ENCB), *Fryxell 1716* (ASU, SMU, SD, pf), *Hinton 16214* (TEX). Guerrero, *Paray 1829* (ENCB), *Hinton 11783* (TEX).

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A NEW SPECIES OF TRIFOLIUM (LEGUMINOSAE) FROM BAJA CALIFORNIA, MEXICO

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Currently, my interest in *Trifolium* centers about sect. *Involucrarium* Hooker. Among material from Baja California, the following taxon, which is evidently new, has come to light. The plant was first collected by I. L. Wiggins and D. Demaree in 1930 but has been collected several times since. I take great pleasure in naming this clover after Dr. Wiggins because of his great interest in the region.